System Overview

BCM50 3.0

Business Communications Manager

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NORTEL

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Chapter 1
Getting started

About this guide

This system overview gives a high-level understanding of the core capabilities and features of the Business Communications Manager 50 (BCM50) 3.0. In addition, it indicates the features not supported with the BCM50 3.0.

Audience

This overview is for installers, network administrators, and others who are interested in the BCM50.

Acronyms

Following is a list of acronyms used in this guide.

Acronym	Description
ADID	Analog Direct Inward Dial
AMIS	Audio Messaging Interchange Specification
APAC	Asia Pacific
BCM	Business Communication Manager
BRI	Basic Rate Interface
CALA	Caribbean and Latin America
CCR	Custom Call Routing
CDC	Compact Daughter Card
CDR	Call Detail Records
CIM	Common Information Model
CTI	Computer Telephony Integration
DMTF	Distributed Management Task Force
DSP	Digital Signal Processor
DTMF	Dual-Tone Multi Frequency
EU	European Union
FEPS	Functional Endpoint Proxy Server

Acronym	Description
FR	Frame Relay
FRU	Field Replacable Unit
GASI	Global Analog Station Interface
GASM	Global Analog Station Module
GATI	Global Analog Trunk Interface
GATM	Global Analog Trunk Module
GNPS	Global Network Product Support
GNTS	Global Enterprise Technical Support
ICC	Intelligent Contact Center
ICCL	ISDN Call Connection Limit
IP	Internet Protocol
ISDN	Integrated Services Digital Network
KEM	Key Expansion Module
LAN CTE	Local Area Network Computer Telephony Engine
MBM	Media Bay Module
MCDN	Meridian Customer Defined Network
MIB	Management Information Base
MWI	Message Waiting Indication
NCGL	Nortel Carrier Grade Linux
NCM	Network Configuration Manager
NCRI	Network Call Redirection Info
NRE	Non Recoverable Engineering
OA&M	Operations, Administration and Maintenance
OEM	Original Equipment Manufacturer
OS	Operating System
PPP	Point-to-Point Protocol
PSTN	Public Switched Telephone Network
PVQM	Proactive Voice Quality Monitoring
QoE	Quality of Experience
SFTP	Secure File Transfer Protocol
SHA1	Secure Hashing Algorithm 1
SIP	Session Initiated Protocol
SMB	Small and Medium Business
SME	Small and Medium Enterprise
SNMP	Simple Network Management Protocol

Acronym	Description
SRG	Survivable Remote Gateway
TAT	Trunk Anti-Tromboning
TDM	Time Division Multiplexing – as found in T1 / E1 trunks
TRO	Trunk Route Optimization
VoIP	Voice over Internet Protocol
VPIM	Voice Profile for Internet Mail

Related publications

This section provides a list of additional documents. To locate specific information, you can refer to the *Master Index of BCM50 Library*.

BCM50 Installation and Maintenance Guide (NN40020-302)

Unified Messaging Configuration Guide (NN40080-501)

CallPilot Fax Set Up and Operation Guide (NN40080-301)

CallPilot Message Networking Set Up and Operation Guide (NN40090-301)

Personal Call Manager User Guide (NN40020-103)

Intelligent Contact Center Set Up and Operation Guide (NN40040-301)

LAN CTE Configuration Guide (NN40020-602)

Call Detail Recording System Administration Guide (NN40020-605)

Activity Reporter Administration Guide (NN40010-627)

Activity Reporter User Guide (NN40010-112)

How to get help

This section explains how to get help for Nortel products and services.

Getting Help from the Nortel Web site

The best way to get technical support for Nortel products is from the Nortel Technical Support Web site:

www.nortel.com/support

This site provides quick access to software, documentation, bulletins, and tools to address issues with Nortel products. More specifically, the site enables you to:

- download software, documentation, and product bulletins
- search the Technical Support Web site and the Nortel Knowledge Base for answers to technical issues
- sign up for automatic notification of new software and documentation for Nortel equipment
- open and manage technical support cases

Getting Help over the phone from a Nortel Solutions Center

If you don't find the information you require on the Nortel Technical Support Web site, and have a Nortel support contract, you can also get help over the phone from a Nortel Solutions Center.

In North America, call 1-800-4NORTEL (1-800-466-7835).

Outside North America, go to the following Web site to obtain the phone number for your region:

www.nortel.com/callus

Getting Help from a specialist by using an Express Routing Code

To access some Nortel Technical Solutions Centers, you can use an Express Routing Code (ERC) to quickly route your call to a specialist in your Nortel product or service. To locate the ERC for your product or service, go to:

www.nortel.com/erc

Getting Help through a Nortel distributor or reseller

If you purchased a service contract for your Nortel product from a distributor or authorized reseller, contact the technical support staff for that distributor or reseller.

Chapter 2
System Overview

Business Communications Manager 50 3.0 (BCM50 3.0) introduces software enhancements, including Session Initiated Protocol (SIP) trunking, to the BCM50 Platform. This release introduces no hardware modifications.

This release of BCM50 introduces the following enhancements:

- Enhancements to the SIP trunk solution
- Introduction of new IP sets and accessories: the 1200 series IP sets, the 1110 IP set and the expansion module for the 1120E and 1140E sets.
- Introduction of new end user features: Meet-Me Conferencing and Silent Record-a-call
- Enhancements to the Intelligent Contact Center solution
- Introduction of Activity Reporter
- Introduction of operability enhancements
- Introduction of NCM4.0 which includes a new NCM feature to support RADIUS for user authentication and authorization.

BCM50 continues to be a complete, converged voice, data, and feature-rich business telephony applications solution for small business and small enterprise branch offices. BCM50 gives you the features and applications of traditional small office PBX and key systems plus the new converged value of IP.

For more information, see “BCM50 features” on page 20.

BCM50 hardware

BCM50 (as shown in Figure 1) is available in six configurations.

- BCM50: The compact main unit, suitable for networks where you do not require integrated data-routing capability or if your networks already have an IP network.
- BCM50a: Includes an ADSL router.
- BCM50e: Includes an integrated Ethernet router.
- BCM50b: Includes an integrated Dual ISDN S/T BRI.
- BCM50be: Includes an Ethernet router and a Dual ISDN S/T BRI.
- BCM50ba: Includes ADSL router and a Dual ISDN S/T BRI.

Figure 1 BCM50e

For more information, see "BCM50e and BCM50a: BCM systems with integrated routers" on page 13 or "BCM50b, BCM50ba, and BCM50be: BCM systems with integrated BRIs" on page 16.

For more information about BCM50 hardware, see the *BCM50 Installation and Maintenance Guide*.

BCM50 main unit

The BCM50 Main Unit (with telephony only) provides call processing and simple data-networking functions. It provides connections for 12 digital telephones, 4 PSTN lines, 4 analog station ports, and 4 connections for auxiliary equipment (auxiliary ringer, page relay, page output, and music source). The BCM50 Main Unit has no router, but it has four LAN ports: one is the OAM port for technicians, and three are for basic LAN connectivity.

A Main Unit contains the following field-replaceable units:

- one programmed hard disk
- one cooling fan
- one router card (BCM50a, BCM50e, BCM50ba and BCM50be only)

Additional BCM50 hardware

The BCM50 expansion unit is a compact unit that accommodates the Media Bay Modules (MBM) used by other BCM platforms. The BCM50 main unit can support a maximum of two expansion units. For more information, see "BCM50 expansion unit and media bay modules" on page 18.

The wall-mount bracket is an inexpensive bracket for mounting the BCM50 or expansion unit to a wall; for more information, see "Mounting kits" on page 19. An optional wiring card, which provides RJ-45 connectors for all main unit trunk and station interfaces, is also available for use with the wall-mount bracket.

The rack-mount shelf is an inexpensive shelf for mounting a maximum of four BCM50 systems into a standard 19-inch rack. For more information, see "Mounting kits" on page 19. An optional patch field that provides RJ-45 connectors for all main unit trunk and station interfaces is also available.

BCM50 supports the complete range of IP telephony capability offered by existing BCM products. These features are enabled through keycodes and require no additional hardware:

- VoIP Gateway (H.323 or SIP): up to 12 VoIP trunks
- VoIP Telephony Clients: up to 32 VoIP Telephony clients, that support the IP Softphone 2050 client, the Mobile Voice Client 2050 and the complete range of Nortel IP phones
- SIP Gateway trunks: up to 12 SIP trunks

BCM50 physical dimensions

BCM50 has a compact plastic enclosure so that you need not add hardware to enable features and applications. The compact size and flexible installation options support fast installations and accommodate the diverse environmental and physical conditions of small businesses.

The following table describes the physical dimensions of the BCM50 main unit and expansion unit.

Dimensions	BCM50 main unit	BCM50 expansion unit
Height	2 in. (5.1 cm)	2 in. (5.1 cm)
Width	8.5 in. (21.6 cm)	8.5 in. (21.6 cm)
Depth	12.5 in. (31.8 cm)	12.5 in. (31.8 cm)

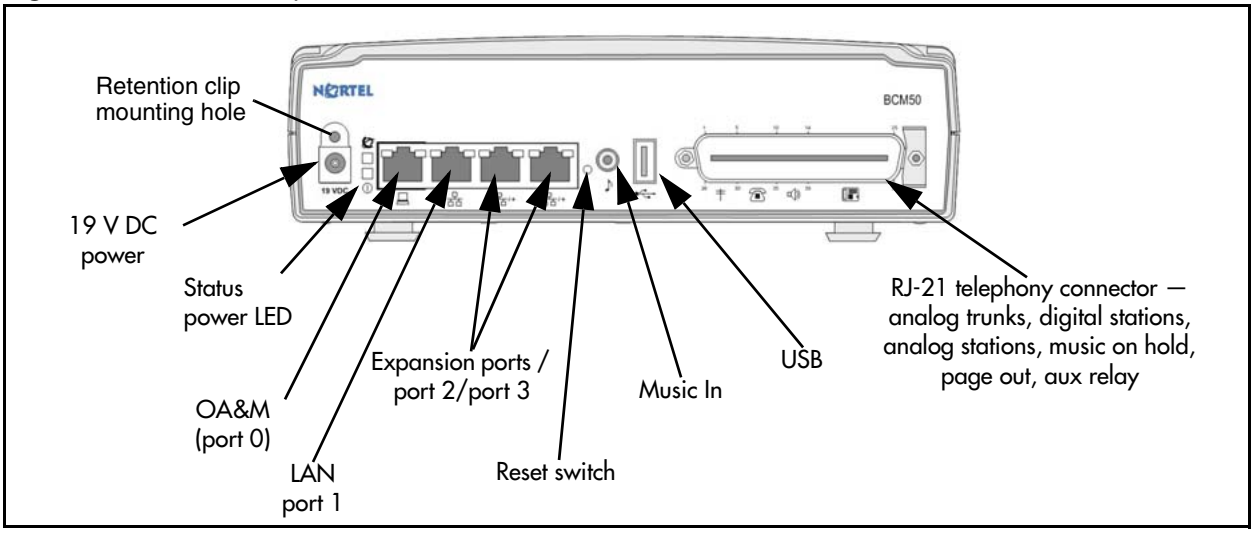
The BCM50 main unit and expansion unit design features include in following components:

- external power supply
- stackable units
- rubber feet that allow unit installation on a desktop or a shelf
- optional wall-mount bracket
- optional rack-mount shelf

BCM50 physical interfaces

The BCM50 interfaces preclude the need for additional hardware. See Figure 2 for a graphical representation of the BCM50 interfaces.

Figure 2 BCM50 Front panel and interfaces



Your BCM50 is equipped with these interfaces:

- Twelve digital station ports support the complete line of Business Series Telephones. These ports are accessible through the front panel RJ-21 connector and are enabled through keycodes.
- Four Analog Loop Supervised Trunks. These ports are accessible through the front panel RJ-21 connector and are enabled through keycodes.
- Four Analog Station interfaces with message waiting and CLID support. These ports are accessible through the front panel RJ-21 connector and are enabled through keycodes.
- Page and auxiliary relay output on the front panel RJ-21 connector.
- Three-port 10/100 Ethernet switch with automatic sensing and automatic polarity. Two of these ports support connecting optional expansion units.
- One 10/100 Ethernet port reserved for direct-access management of the system.
- Music on hold input supported either through the front panel jack or an RJ-21 connector.
- USB port to enhance BCM50 management.

You can extend the capacity of your system by using the optional “BCM50 expansion unit and media bay modules” on page 18.

Telephony features

BCM50 provides a full set of telephony features that can respond to the various requirements of your business. BCM50 supports the following features and components:

- Full set of base telephony features consistent with the BCM portfolio.

- Business Series Telephones including Doorphone
- analog station terminals, including phones and fax machines

IP telephony features

BCM50 offers the complete range of IP telephony features currently provided in the BCM50 product line:

- G.711 and G.729 codecs
- echo cancellation
- H.323 IP trunking and MCDN over H.323
- SIP and SIP proxy
- MCDN SIP trunking
- Gatekeeper
- T.38 Fax

Note: Support for desktop clients includes Nortel IP telephone portfolio including IP Phone 1210, IP Phone 1220, IP Phone 1230, IP Phone 2001, IP Phone 2002, IP Phone 2004, IP Phone 2007, IP Phone 1110, IP Phone 1120e, IP Phone 1140e, IP Audio Conference Phone 2033. Support for soft-clients is offered through the IP 2050 software phones that extend voice services to mobile and home-based employees over the Internet.

BCM50e and BCM50a: BCM systems with integrated routers

BCM50 is available with an optional integrated ADSL or Ethernet router. These units suit the needs of small businesses and small enterprise branch offices that require external data networking, such as Internet access or VPN-based networking to other offices.

Two variations of the BCM50 have an integrated router, depending on the WAN interface you require: the BCM50e (Ethernet WAN) and, BCM50a (ADSL WAN). Both routers have the following data features:

- secure Internet access
- multisite VoIP trunking using secure VPN tunnels
- wide-area VoIP applications with remote user support
- remote IP management and support using VPN clients

Common features and capabilities

BCM50a and BCM50e share the same functionality, which focuses on secure Internet access and VoIP.

BCM50e and BCM50a have three additional Ethernet LAN ports for a total of six LAN ports for local premises use. All Ethernet ports are 10/100 Mb/s automatic sensing and support automatic polarity. Therefore, you require no crossover cable to connect data hardware to the unit. An additional port is provided for WAN access for, either Ethernet or ADSL.

The following features make BCM50a and BCM50e attractive for small sites that want to become Internet-capable and multisite enterprises with many small sites. Until now, these sites could not be part of the corporate WAN because of the high cost of traditional WAN connectivity and managed service.

VPN

- 10 IPSec Branch Office Tunnels (peer-to-peer)
- IPSEC client termination supported
- support for bandwidth management
- support for Dynamically addressed peers – ABOT
- support for Client Tunnel origination (not termination) to simplify the connection to a larger VPN Router network
- IKEv1 Main Mode
- IKEv1 Quick Mode
- Diffie-Hellman Group 1,2
- IPSec Tunnel Mode
- ESP
- NAT Traversal

NAT

- many-to-one, static, many-to-many
- port forwarding
- IPSec pass through
- NAT support for tunnel mode IPSec tunnels
- Throughput traffic performance - 23.1 Mb/s

IP Services

- DHCP client
- DHCP server with support for Nortel Internet Telephones
- DHCP Relay supported
- DNS Proxy
- DNS with VPN client
- WAN failover supported
- PPPoE
- PPTP (ethernet router only)
- Configurable MAC address
- Clear text traffic:
  - — WAN to LAN 33.9 Mb/s
  - — LAN to WAN 30.5 Mb/s

Security Services

- cryptographic services
- DES and 3DES
- data authentication SHA-1
- data authentication MD-5
- authentication services
- preshared secrets
- security services
- stateful firewall
- intrusion detection
- AES support
- digital certificates supported
- RADIUS support

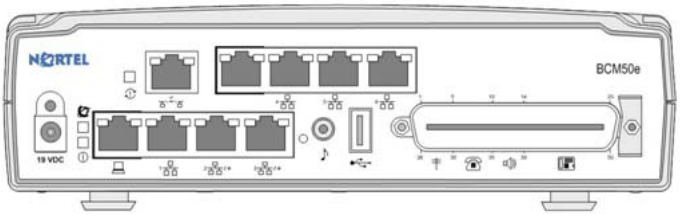
Router

- Clear text routing
- Static: through tunnel
- RIP v1: through tunnel and clear text
- RIP v2: through tunnel and clear text

BCM50e

The BCM50e in Figure 3 provides call-processing and data-routing features and is suitable for networks that require data-routing capability using an integrated Ethernet router. The WAN interface port provides 10/100 Ethernet with automatic sensing and automatic polarity. If you have existing or alternative WAN access technology, you can still benefit from the VoIP features of the BCM50.

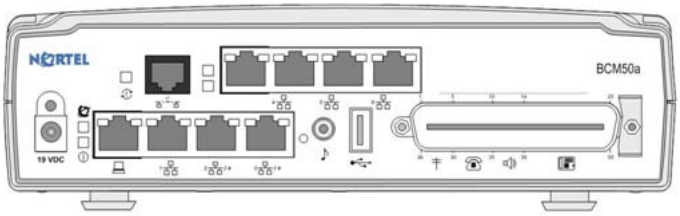
Figure 3 BCM50e front panel



BCM50a

The BCM50a in Figure 4 provides call-processing, data-routing features, and an integrated ADSL modem. The BCM50a is a stand-alone set of integrated applications. With the BCM50a, you have complete voice and Internet service with efficiency and convenience.

Figure 4 BCM50a front panel



These features provide a complete, integrated Communications Server/ADSL access package for ease of interconnecting with service-provider ADSL networks:

- ITU G.992.1 (G.DMT)
- G.992.1 Annex A
- ITU G.992.2 (G.Lite)
- ANSI T1.413 Issue 2
- DSL Forum document TR-042 ATM Transport over ADSL
- G.hs 994.1
- G.ploam G.997.1
- Autonegotiation rate adaptation
- RFC 2364 PPP over AAL5
- RFC 2684 Multi protocol Encapsulation over ATM, both Bridged and Routed encapsulation
- Support for British Telecom SIN 329

- Broadband IP Products requirements for End User NTE equipment, where the router and ADSL modem functions are integrated into one device
- RFC 1483 Multi-protocol over AAL5
- RFC 2365 PPP over AAL5
- RFC 2516 PPPoE
- Traffic-shaping UBR, CBR
- ATM forum UNI 3.1/4.0 PVC (minimum 5 PVCs)

BCM50b, BCM50ba, and BCM50be: BCM systems with integrated BRIs

The BCM50 system provides private network and telephony-management capability to small and medium businesses the EMEA and APAC markets. The BCM50 integrates voice and data capabilities, IP telephony gateway functions, and data-routing features into a single telephony system. The BCM50 is a compact system that you use to create and provide telephony applications for use in a business environment.

Common features and capabilities

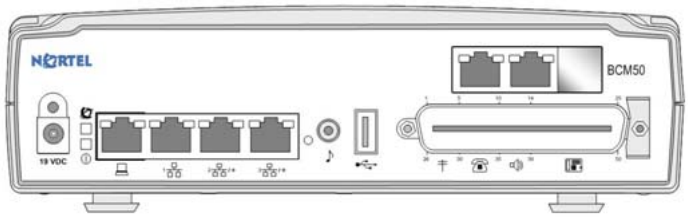
- BRI Compact Daughter Card (CDC)— Performance conforms to ITU I.430, ETSI ETS 300012, ANSI T1.605, and safety standards and lightening protection
- Additional CDC connector, for a total of two CDC slots
- Xilinx FPGA - XC3S400-4FT256C
- Integrated eight-port 10/100 Ethernet switch to support future eDSP CDC (upgraded from five-port)
- 2.5 in. hard drive and new bracket
- Optimized position of fan cable, SATA cable, and hard-drive connector
- POL Current Limiting
- Introduce BRI and improve pack performance, and customer feature set.
- Memory parity
- Upgrade DSP and microprocessor
- GASI support

BCM50b

The BCM50b Main Unit provides functionality similar to the BCM50 main unit. The difference is that the BCM50b main unit has two integrated BRI ports that replace the four analog lines on the RJ-21 telephony connector.

- new CSC with integrated BRI in place of integrated GATI
- keycode BRI ports

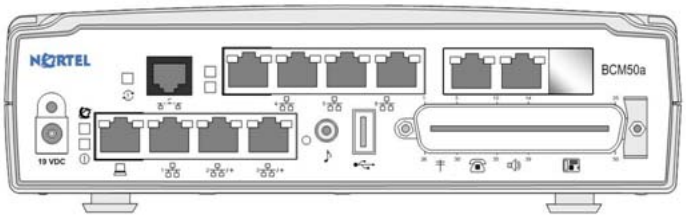
Figure 5 BCM50b Front panel



BCM50ba

The BCM50ba Main Unit provides similar functionality to the BCM50a main unit. The difference is that the BCM50ba main unit has two integrated BRI ports that replace the four analog lines on the RJ-21 telephony connector.

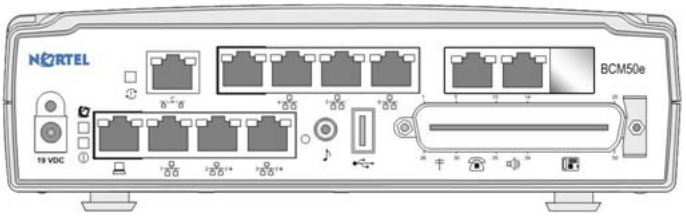
Figure 6 BCM50ba Front panel



BCM50be

The BCM50be Main Unit provides similar functionality to the BCM50e main unit. The difference is that the BCM50be main unit has two integrated BRI ports that replace the four analog lines on the RJ-21 telephony connector.

Figure 7 BCM50be Front panel



BCM50 expansion unit and media bay modules

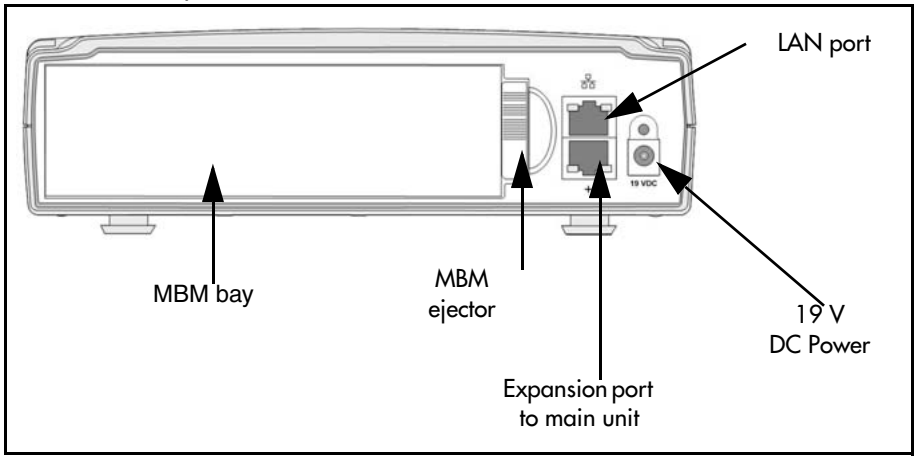
You can expand BCM50 trunk and station capacity by connecting up to two external BCM50 expansion units. Expansion ports on the BCM50 are enabled through keycodes.

The expansion unit fits easily with the BCM50 and is easy to integrate and install using the wall-mount and rack-mount accessories. The expansion unit connects to the BCM50 using an RJ-45 CAT5 cable and uses its own external power supply, both of which are provided with the expansion unit.

Each expansion unit can support one Media Bay Module (MBM) and, the same modules currently supported in the BCM products. BCM50 supports the following Media Bay Modules:

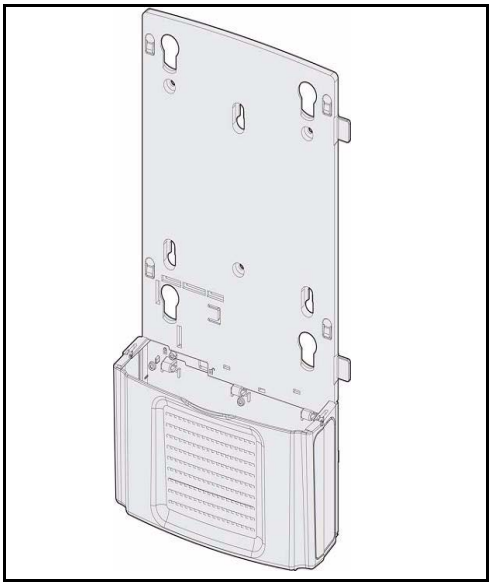
- 4x16 Combo (4 analog trunks, 16 digital stations) — North America only
- 8x16 combo (8 analog trunks, 16 digital stations)
- ADID4 and ADID8 modules — North America only
- ASM8+ (8-port analog station interface) — North America only
- CTM4 (4-port CLID trunk module) — North America only
- CTM8 (8-port CLID trunk module) — North America only
- DTM (digital trunk module)
- BRI (ISDN Basic Rate trunk module)
- DSM16+ (16-port digital station module)
- DSM32+ (32-port digital station module)
- GATM4 (4-port global analog trunk module)
- GATM8 (8-port global analog trunk module)
- GASM8 (8-port global analog station module)
- R2MFC

Figure 8 BCM50 Expansion unit



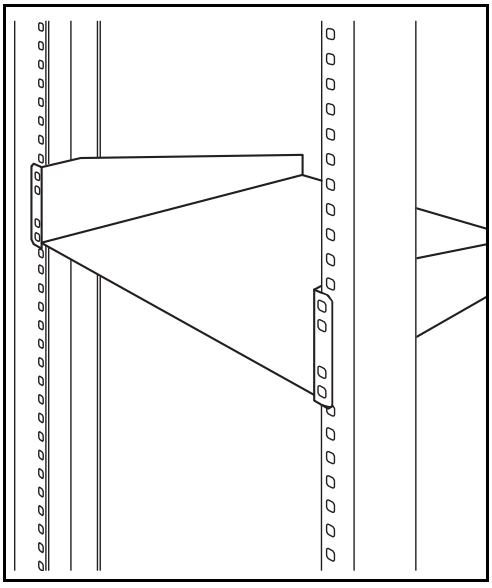
Mounting kits

Businesses can have a range of physical environments in which the system must be installed. The BCM50 has optional accessories you can use to tailor the installation to the needs of the location.



Small System Wallmount Bracket

You can use this optional bracket to mount the BCM50 and expansion unit on a vertical surface. Attach the bracket to the surface and hang the BCM50 from the bracket. The details on the bracket ensure that the BCM50 securely locks into place. The bottom of the bracket includes a covered cable tray to organize cables. An optional add-in card that mounts into the cable tray is available, to provide RJ-45 connections for the main unit trunk and station interfaces.



Small System Rackmount Shelf

You can install this optional shelf in a standard 19-inch rack and mount the BCM50 and expansion unit on it. The details on the shelf firmly lock the BCM50 in place. The bracket also provides space to store power supplies for the BCM50. An optional patch panel is available to provide RJ-45 connections for the main unit trunk and station interfaces.

BCM50 features

BCM50 features are summarized in two sections, "New features" and “Existing features” on page 29.

New features

The following list indicates the new features introduced with BCM50 3.0.

- “Software upgrade” on page 20
- “SIP trunk enhancements” on page 21
- “IP phone 1200” on page 22
- “IP phone 1110” on page 22
- “Meet-Me Conferencing” on page 22
- “Silent Record-a-call” on page 23
- “Intelligent Contact Center” on page 24
- “Activity Reporter” on page 25
- “Operability enhancements” on page 26
- “Security enhancements” on page 26
- “Microsoft Vista operating system” on page 27

Software upgrade

The upgrade impacts all on-box software of a field installed BCM50 1.0 or BCM50 2.0 system to BCM50 3.0 software while preserving customer programmed data. New software introduced as part of the BCM50 3.0 program is installed as part of the upgrade. An upgraded BCM50 3.0 system is functionally equivalent to a factory BCM50 3.0 system. The target time for an upgrade is 45 minutes.

The upgrade with BCM50 and Business Element Manager supports remote and scheduled upgrades. This new capacity is significant for partners and administrators to reduce installation costs and business impacts. Systems that operate in SRG mode are upgraded to the new software but remain in SRG mode after the upgrade.

Support exists for the following upgrade paths:

- BCM50 1.0 to BCM50 3.0
- BCM50 2.0 to BCM50 3.0
- BCM50 1.0 to BCM50 2.0 to BCM50 3.0

SIP trunk enhancements

SIP REFER

BCM50 3.0 supports SIP REFER, which is the call transfer mechanism for SIP. BCM50 responds to a REFER request on an existing call by making a second call and transferring the two calls together. BCM also responds to a REPLACE request on an incoming call by replacing the identified incoming SIP call with this new call.

SIP refer supports two types of call transfer:

- Blind (or Unattended): The TransferOR puts the primary call on hold, then dials the Transfer Target and completes the transfer without communicating with the Transfer Target. The TransferEE hears ringback on the secondary call and connects when the Transfer Target answers.
- Consult (or Attended): The TransferOR places the primary call on hold and establishes a Consult call (consultation) to another party. After the consultation, the TransferOR completes the transfer, causing the TransferEE to connect to the Transfer Target and replaces the Transfer Target's call with the TransferOR.

SIP proxy failover

A new setting, called Route all calls using proxy, on the SIP Proxy tab in the Business Element Manager, determines whether to ignore the Routing Table for SIP calls. With SIP proxy failover, the SIP Proxy configuration is used. The SIP Proxy Domain is mandatory and is used in SIP message headers.

A dedicated SIP Proxy Agent provides outbound proxy failover. The SIP Proxy Agent runs within the SIP Component of the FEPS process on the BCM.

To provide an alternative call route to a destination, the SIP Proxy Agent interacts with the Functional Endpoint Proxy Server (FEPS) during outgoing SIP trunk call setup. When proxy failover provides no on-demand SIP proxy information, the SIP Proxy Agent interacts with the SIP facilities within the FEPS to periodically poll each configured SIP proxy server to maintain the up or down status of each server.

RFC 2833

With RFC 2833 the BCM SIP gateway can send and receive Dual-Tone Multi Frequency (DTMF) digits on SIP trunks using RFC 2833. This feature does not apply to H.323.

For outgoing digits received, the core software enters the digits as DTMF. The Digital Signal Processor (DSP) intercepts the digits and encodes and them as described in RFC 2833. This is required in both short- and long-tone mode whenever the media path goes through the BCM. When the media path does not go through the BCM, the short tone digits are sent to Functional Endpoint Proxy Server (FEPS) in VDI messages.

For incoming digits, the core software handles incoming digit indications from FEPS and provides short-tone functionality. While the digits received can be longer than the short-tone duration, the long duration is not required.

SIP trunk authentication

SIP trunk local users are accounts used to authorize remote SIP entities when they attempt to connect through the SIP trunk interface to place calls through the BCM. SIP trunk accounts are also used for remote connections to the ISP and incoming call requests. The total number of SIP trunk accounts is 240.

Configuration of domain and ports for remote SIP trunk endpoints

Configuration and use of domain and port entries for remote endpoints allows more flexible installations, compared to the BCM 4.0 and BCM50 R2 use of IP addresses only. The BCM50 3.0 introduces RFC3263-based DNS support for locating SIP servers. The addition of DNS support means that customers do not need to know the IP addresses of those remote servers.Standards based DNS support using RFC3263 to simplify network deployment.

Optional G.711 based transport of FAX communication

This solution will allow the choice of whether T.38 or G.711 is used to transmit fax calls over SIP trunks, to and from the BCM. The choice is decided during configuration, and applies to all SIP trunk calls

If T.38 is not configured, then SuperG3 fax and V.34 modem will be supported over G.711. Previously, they had to use G3/V.17 in case there was a switch to T.38 which cannot encode V.34 successfully.

IP phone 1200

BCM50 3.0 supports new IP Phone 1200 series and associated expansion modules.

IP phone 1110

BCM50 3.0 supports new IP Phone1110 and associated expansion module.

Meet-Me Conferencing

Meet-Me Conferencing provides feature-rich, high density conferencing capabilities for BCM users. Designed to provide a more sophisticated feature set for formal conference calls, Meet-Me Conferencing allows parties to establish a teleconference by calling in to a specified bridge number at an agreed on time. One party acts as the chairperson and has additional powers to start, stop, secure and control the conference.

Conferences are initiated by calling in to the system on designated lines or to a specified directory number. The service responds by prompting the caller for the conference ID and optional pass-code. The caller then receives music-on-hold until the chairperson starts the conference. At that point, a multi way voice conference is established with all parties in the conference.

Meet-Me Conferencing supports DTMF-based commands and display/softkey based commands, so all users, regardless of phone, have access to participant and chairperson controls. All parties can use DTMF-based commands to control their participation (example: mute on or off). When using DTMF-based commands, the help menu will provide an audible list of existing commands. Additionally, the system will provide voice prompts to assist the user. For example, when a user turns on the mute feature, they will receive a voice prompt saying, muted. When they turn off the mute feature, a voice prompt will say, un-muted.

Display set users receive status information by way of the display. Softkey equivalents are offered to softkey-set users.

Status display and softkeys for internal participants include the following:

- status shows elapsed time, number of participants
- VIEW softkey cycles through list of participants, showing name (internal) or CallerID (external)
- command to turn on or off the mute line

Chairperson commands include the following:

- turn conference mute on or off. While the conference is muted, only the chairperson can speak
- selectively mute or disconnect a participant with VIEW
- lock or unlock a conference. While locked, no new participants can join conference.
- change continuation or announcement settings
- all participant commands (self-mute on or off, participant count, list commands)

The Meet-Me Conferencing feature supports 18 active ports spread over as many conferences sessions as desired. Note that the pool of conference ports is shared between Meet-Me Conferencing and the ad-hoc conference feature. Since the total pool of ports is 18, this means that if 18 ports are in use for Meet-Me Conferencing, there will be no available ports for ad-hoc conferences. Similarly, if 18 ports are being used for ad-hoc conferences, there will be no ports available for Meet-Me Conferences.

Silent Record-a-call

Intelligent Contact Center Agent and Supervisor ad hoc silent record a call. This enables an agent or supervisor to silently record the call they are on. The recorded call is left in the agents/ supervisors mailbox or skillset mailbox.

This feature does not provide the ability for a supervisor to trigger silent call recording while listening in on an agent's call.

Intelligent Contact Center

Intelligent Contact Center API's

Enhanced Intelligent Contact Center API's are included providing more flexibility and functionality enabling 3rd party applications, like CRM adaptors, to more effectively integrate with the BCM50 Intelligent Contact Center. The API's are:

- Agent log in,
- Agent log out,
- Not ready

For more information on ICC and the existing features, see “Intelligent Contact Center” on page 51.

Not Ready Time Out

Previous to this release, when a call is presented to an agent and is not answered, the call is returned to the skillset queue and the agents set is placed into the not ready mode. The agent receives a visual indication that they are placed into the not ready mode and no further calls are presented to the agent until they manually take themselves out of the not ready mode. This enhancement provides an administrable timer that when the timer has expired the agent will be made active and receive calls. The agent does not have to manually make themselves available.

Not Ready Audible Notification

When an agents is placed into the Not Ready Mode the agent receives an audible and visual reminder that they are in the not ready mode. This is an enhancement to BCM50 2.0 where only a visual reminder is provided.

Agent Break Time Configurable on Agent Basis

This enhancement allows the Agent Break (wrap time) Time to be configurable on an agent by agent basis. The Agent Break Time, is the time that the agent is automatically taken out of the skillset after completion of a call. Typically, this time is required to complete paper or other activities associated with the call. Currently Agent Break Time is only configurable on a skillset basis. This provides more flexibility to call centre manager enabling individual agents to have different break times based on their experience and or other needs.

Primary and Secondary Alerts Configurable on a Skillset Basis

Primary and Secondary Alerts are now configurable on a skillset by skillset basis. Primary and Secondary Alerts provide visual indication when calls have been waiting beyond specific thresholds to agents and supervisors. In BCM50 2.0 the Primary and Secondary Alerts are configurable on a system wide basis, not on a skillset basis. The enhanced capability provides more flexibility for the Intelligent Contact Center manager as each skillset can have different Primary and Secondary Alerts based the characteristics of the skillsets. For some skillsets it may be acceptable to expect and tolerate longer wait times then others. As such the Primary and Secondary Alerts can be established specifically for each skillset.

Reporting for Contact Center

There are many enhancements to the Reporting for Contact Center included in BCM50 3.0. These include additional information to existing reports, more flexibility in how reports are generated and a new Call Audit that provides a complete view of everything that occurs on a call from the moment it arrives in the Contact Center until it leaves. These enhancements include:

Call Audit Report

- This is a new 'cradle to grave' report

Answered Call Report

- New report that reports CLID and DNIS of answered calls

Agent Audit Report

- New ringing and not available fields

Abandon Call Report

- Added DNIS and Skillset fields

Agent Activity Report

- Added available time, not available time and ringing time fields

Agent Average Report

- Added internal transactions, non CC transactions, not ready time, not available time, ringing time and supervisor monitoring time

Agent Capacity Report

- More granularity
- Breaks down the instances and time based on each time all agents are busy

Agent Profile Report

- Can now report on multiple skillsets,
- Added not available time, ringing time, supervisor monitoring time, internal transactions and non CC transactions

Real Time reports

- Added new agent states; ringing and not available

New Agent selection method

- Greater flexibility in what agents reports will be reporting on and allows Agent Reports to be generated by individual agents as well as skillsets.

Activity Reporter

For information about the Activity Reporter and Activity Reporter Basic features, see the *Activity Reporter Administration Guide* and the *Activity Reporter User Guide*.

Operability enhancements

Power On Self Test logging

Power On Self Test (POST) is a set of hardware tests occurs early in the system boot cycle. The data from these tests will be captured and published to the standard log system when the boot cycle is complete. When there is failure from POST, alarms and SNMP traps will be raised through existing DiaLogger component.

When BCM 50 is powered up, it goes through a number of POST to validate the system. Results from the POST are currently displayed on the serial port in real time. If there are any failures, the results are also captured on Flash. It is desired to capture all POST results, whether they are passed or failed, so that all results can be displayed at a later time for analysis.

The solution provided here is a complete solution for making POST results available on the main file system.

IP Music enhancements

The volume normalized enhancement resolves issues where the on hold play back volume is too loud and can not be adjusted.

The multiple files upload feature enhancement allows customers to upload multiple music files in a compressed format.

The files preservation over upgrade enhancement resolves issues where music files are not preserved over upgrade, specially important for professional music recordings.

Business Element Manager change tracking logs

Bring back the tracking changes log that was available on BCM 3.x this log was very useful in validating and checking steps that lead up to a failure and also validated the steps the installer took to get in to the configuration problem. This log tracked all changes that had been applied to the system since it was initialized. The log records the entire configuration steps, not just the final result.

System ID field copy

This feature allows you to copy the System ID field from the Element Manager to your PC clip board, and can then paste it directly into the KRS web tool interface. By implementing this simple ease-of-use functionality, you can remove the human error in querying, downloading and applying the wrong keycode file to a system that will impact the installation time. Also, this can help to prevent the case of applying the new authorization code to the wrong system ID and generate the wrong keycode which can only be reset by Nortel support which impacts installation time, potential miss customer delivery of system, and cost of ownership.

Security enhancements

In addition to the enhancements mentioned in “SIP trunk authentication” on page 22, BCM50 3.0 includes these new security enhancements.

Last failed login time

The last failed login time information is added to the current user panel in BEM and displays the last time the login was attempted and failed.

Web access on Secure Socket Layer Version 3

BCM50 3.0 sets the default Secure Socket Layer (SSL) protocol to SSLv3 for Web access.

Platform accounts

Platform accounts are integrated accounts that allow access to BEM and other functions based on privileges. The maximum number of accounts is increased to 280 active accounts for each BCM.

User ID length

The maximum character length for the user ID is 128 characters.

Microsoft Vista operating system

BCM applications for BCM50 support the following Vista versions: Windows Vista Business, Windows Vista Ultimate, and Windows Vista Enterprise. BCM applications support both 32-bit and 64-bit versions of Windows Vista, except for the following limitations:

- The CTE TAPI option is not supported by the 64-bit version of Windows Vista (x64).
- Personal Call Manager is not supported by the 64-bit version of Windows Vista (x64).
- Reporting for Contact Center is not supported by the 64-bit version of Windows Vista operating systems.
- CallPilot Desktop Messaging 4.0 does not support Groupwise 7.x on Windows Vista operating systems.
- The IP SoftPhone 2050 is not supported by the 64-bit version of Windows Vista operating systems.
- VPN client is not supported by the 64-bit version of Windows Vista operating systems.

BCM50 application	**Vista compatible**
Activity Reporter and Activity Reporter Basic	Yes
Business Element Manager	Yes
BCM Monitor	Yes
CDR	Yes
CDR Pull Client	Yes
CDR Livestream	Yes

BCM50 application	Vista compatible
Desktop Assistant Pro	Yes, with exception. See WinHlp32.exe help file exception (page 28)
Digital Mobility Controller	Yes
Digital Mobility Service Tool	Yes
IP Softphone 2050	Yes (32-bit version only)
IP client 2050 v2 and QoS	Yes
ipView Software Wallboard Setup and Operation Guide	Yes
LAN CTE	Yes
LAN CTE Client	Yes
LAN CTE TAPI Service Provider	Yes (32-bit version only)
NCM (server and client)	Yes
VPN	Yes, Nortel VPN Client v6.07 (32-bit version only). See WinHlp32.exe help file exception (page 28) and VPN exceptions (page 28) for known issues.
Personal Call Manager	Yes (32-bit version only)
Reporting for Contact Center	Yes
SSH Client	Yes
Startup Profile Template	Yes
Unified Messaging Client	Yes, with exception. See Unified Messaging Client exceptions (page 29)
Call Pilot Manager	Yes
Multimedia Contact Center (agent and caller)	Yes
Mailbox Manager	Yes

WinHlp32.exe help file exception

WinHlp32.exe, previously used to display the help files (.hlp files), is not included in Microsoft Windows Vista. The Windows Help program does not ship as a component of Vista. Also, third-party programs that include .hlp files are prohibited from redistributing the Windows Help program with their products. To view 32-bit .hlp files, you must download the program from the Microsoft Download Center, and then install it on your computers.

VPN exceptions

The Nortel VPN Client for Vista has the following limitations:

- The Nortel VPN Client must be run as an administrator. UAC always prompt for elevation when it runs.

- The VPN Client installs and runs only as an application. This is due to Vista services hardening and the deprecation of the GINA infrastructure.
- Support exists only UDP encapsulation. This is due to changes in the Microsoft stack, which prevents ESP packets from reaching the VPN driver as it is currently implemented. Enable UDP encapsulation in the Contivity switch group profile. For Vista users, the NAT Traversal setting must have any value other than Not Allowed.

Unified Messaging Client exceptions

The Unified Messaging Client requires a new compatible fax driver from ImageMaker.

CallPilot Desktop Messaging 4.0 does not support Groupwise 7.x on Vista. You can download Windows Help that is used by CallPilot help from the Microsoft Download Center. The Desktop Messaging installation can appear to be stalled for several minutes when you are completing the installation process.

Vista Windows Mail purge messages fails because of Microsoft limitations. To avoid this failure and keep deleted messages in your Inbox, navigate to Tools > Options > Advanced. Deselect the Use the Deleted Items Folders with IMAP accounts check box. To show deleted messages in your Inbox, navigate to View > Current View. Select the Deleted Messages check box.

Existing features

In addition to the new features introduced with BCM50 3.0, BCM50 includes features that are present in previous versions. These include:

- “BRI version” on page 31
- “R2MFC MBM support” on page 31
- “EU-compliant routers M222 and M252 firmware” on page 31
- “WAN failover” on page 32
- “Integrated Services Digital Network Basic Rate Interface dial-up support” on page 32
- “Network Configuration Manager support for BCM50” on page 32
- “Global Analog Trunk Interface localization” on page 32
- “Analog Direct Inward Dial Media Bay Module” on page 32
- “8x16 Media Bay Module” on page 33
- “Next generation IP phones” on page 33
- “SIP and H.323 interoperability” on page 33
- “Hardware inventory” on page 33
- “Proactive Voice Quality Monitoring” on page 33
- “Ad Hoc conferencing” on page 34
- “Meridian Customer Defined Network Trunk Anti-Tromboning with integrated applications” on page 34
- “Session Initiated Protocol” on page 35
- “Security” on page 35
- “Terminal and mobility support” on page 37

- “Global markets” on page 37

The following table summarizes the existing BCM50 features and capabilities. For new features and capabilities introduced with BCM50 3.0, see “New features” on page 20.

	BCM50 existing features
Core Telephony	• Digital Mobility • Doorphone • Ad Hoc Conferencing • New Zealand, Mexico, Poland profile updates • GASM Poland and Australia CLIDGATx (Bahrain, Ireland, Hong Kong, and Peoples Republic of China) • GATI profiles (United Kingdom, Poland, Mexico, Taiwan, Brazil, Australia, and New Zealand) • Modem answer on CLID feature
IP Telephony	• WLAN IP Phones • IP Phone 2007 • IP Audio Conference Phone 2033 • IP Softphone 2050 • IP KEM • IP Phone 1120E • IP Phone 1140E • SIP trunk features • H323 Interop (SN08, SN09, SE09) • SIP/H323 Interop (CS1K 4.5/5, MCS5100 3.5 and 4.0) • IP Phone 1110 • IP Set Firmware • SIP/H323 Interop (BCM 4.0 and BCM 3.7)
Management	• PVQM • Citrix of Element Manager • Remote and Scheduled Upgrade • NCM Support • ISDN Dial-up
Data and Security	• Security • WAN Failover • EU routers with Contivity v2.5 and VPN Client Termination

	BCM50 existing features
Applications	• Intelligent Contact Center • Reporting for Contact Center • IP MOH • MCDN TAT • MMCC • Hospitality
Platform	• BRI Versions — BCM50b — BCM50ba — BCM50be • BCM50 Upgrade CD • SRG50 Support • 8x16 MBM • ADID MBM (North America only)

BRI version

BCM50 integrates two-port BRI S/T trunks for EMEA and Asia Pacific (APAC) markets for customers who need digital trunking. The analog trunk versions are still available separately for customers who require them.

R2MFC MBM support

BCM50 supports the R2MFC MBM in selected Caribbean and Latin America (CALA) and APAC countries. See the country matrix in "Global markets" on page 37.

EU-compliant routers M222 and M252 firmware

BCM50 routers deliver Removal of Hazardous Substances (RoHS) compliancy for network infrastructure, or 5/6 compliancy. This requires new hardware for both the Ethernet router and the ADSL router. The new hardware is based on a common architecture for both routers and is also common to Contivity EU releases.

These new features apply to the M222/252 routers only. A software upgrade is available for installed M221/251. The following features align to Contivity 2.5 with the addition of VPN client termination support.

- VPN Client Termination (new)
- Port Restricted Cone NAT
- SIP firewall ALG
- Nailed Up tunnels
- SSH, SSL and Secure FTP
- New hardware support for ADSL2+
- Client emulation enhancements

- Client management privileges
- Failover IP assignment for automatic assignment of fail over site IP address
- X.509 digital certificates
- New DSL version support for ADSL2+

Note: M221/251 refers to the routers shipped with BCM50 1.0 units, and M222/252 refers to the new EU-compliant routers shipped with EU BCM50 2.0 and BCM50 3.0 units.

WAN failover

The router hardware simplifies WAN failover as well as future management integration through the internal serial connector. The router provides support for WAN failover on all BCM50 platforms with M222/252 routers.

WAN failover allows calls that experience issues using the WAN link to continue over the soft modem or LAN or ISDN.

Integrated Services Digital Network Basic Rate Interface dial-up support

The BCM50 requires a data layer over the channelized Integrated Services Digital Network (ISDN) for remote management dial-up over Basic Rate Interface (BRI). Support is available for remote management over BRI over the integrated BRI CDC or BRI MBM configured for ISDN support. Support is available for all on-demand and scheduled management tasks, are such as CDR collection, backup and restore, software updates, and log collection.

Network Configuration Manager support for BCM50

Network Configuration Manager (NCM) support for BCM50 is delivered as a new release. The product is branded NCM 4.0 and is delivered to new customers on a new CD. For more information, see “Network Configuration Manager” on page 45.

Global Analog Trunk Interface localization

Global Analog Trunk Interface (GATI) supports EMEA, China, and APAC countries where the MBM is currently sold. See the country matrix in “Global markets” on page 37. Some profiles require new Disconnect Supervision (DS) or Caller ID (CLID) support as described in Table 1" Country matrix" (page 38).

Analog Direct Inward Dial Media Bay Module

BCM50 adds Analog Direct Inward Dial (ADID) Media Bay Modules (MBM) (ADID4 and ADID8) for North America, Taiwan, and Hong Kong markets. This MBM is backward-compatible to BCM 4.0.

8x16 Media Bay Module

BCM50 has an 8x16 Combo MBM to deliver GATM8 plus DSM16 capability in one MBM. It requires only one expansion chassis and is available in all markets where the GATM8 or DSM16 is sold. This MBM is backward-compatible to BCM4.0.

Next generation IP phones

BCM50 supports Next Generation IP phones from BCM4.0. PVQM, Desktop Assistant, and Business Element Manager button programming includes support for both existing sets and new sets.

SIP and H.323 interoperability

BCM50 and SRG50 match BCM 4.0 SIP and H.323 interoperability. For SIP support, see "Session Initiated Protocol" on page 35.

SIP interoperability includes the following products:

- CS1000 4.5 and 5.0
- MCS5100 3.5 and 4.0

H.323 interoperability includes the following products:

- CS1000 4.5 and 5.0
- CS2000 SN08 and SN09/09FF/09U
- CS2100 SE08 and SE09
- MSC5100 3.0 and 3.5
- IPT 3.01

Hardware inventory

As part of the BCM50 management changes, the Business Element Manager hardware inventory panel and the Entity MIB allow you to remotely view detailed information about the CSC, integrated router, and integrated BRI CDC hardware. Additionally, visibility of other FRU components, such as fans, provides a complete hardware inventory view of all BCM50 hardware components to the FRU level.

Proactive Voice Quality Monitoring

With the proactive voice quality monitoring (PVQM) capability, you can set call-quality thresholds for IP sets and receive an alert and if these thresholds are exceeded. You can proactively identify voice quality of experience (QoE) issues for every call. In turn, you can troubleshooting of voice-quality issues within the network.

PVQM supports calls from an IP set to any other set or trunk. The measured call-quality metrics includes the following.

- packet loss
- inter-arrival jitter

- listening R-value
- RTCP round trip delay

With PVQM, a system-wide summary view of threshold-violation alert occurrences is maintained. Threshold violations can be sent as alarms and used by the central AppManager VoIP performance-monitoring product from NetIQ to generate a system-wide view of the voice quality of the network and to help diagnose voice-quality issues. The alarms include extensive call-quality information in accordance with IETF RTCP-XR RFC 3611.

PVQM on BCM50

- provides the ability to monitor the quality and integrity of IP-based voice networking
- is a significant differentiator in VoIP convergence network sales with its market-leading, proactive focus on every call.
- mitigates customer issues to determine whether the data network or the BCM is at fault when call-quality issues situations occur
- provides consistency in the QoE solution across Nortel enterprise call servers to facilitate mixed network deployments

Ad Hoc conferencing

Currently, the BCM supports three-party conferencing. Ad-Hoc Conferencing extends this capability to support multi party conferencing.

Ad-Hoc conferencing

- provides a user interface model which is similar to the current F3 conference
- ensures no impact on the user’s feature button footprint (that is, no requirement exists for additional IC keys or for an additional feature key)
- provides the current three-party conferencing capabilities, allowing users the flexibility to have larger multi-party conferences
- supports up to 18 simultaneous participants on multiple conferences

Meridian Customer Defined Network Trunk Anti-Tromboning with integrated applications

The BCM currently uses Meridian customer-defined network (MCDN) signaling to optimize network–resource use to transfer or forward station-to-station calls. With this feature, voice mail and autoattendant applications can use MCDN capabilities to optimize network use.

MCDN trunk anti-tromboning (TAT) on BCM50

- provides customers with optimal use of trunk facilities
- enables a large number of feasible networking scenarios to serve customers

With MCDN TAT, BCM can determine whether calls routed across a network by the integrated AutoAttendant or Voicemail should invoke TAT or Trunk Route Optimization (TRO) MCDN to optimize the trunking network connection.

Session Initiated Protocol

BCM supports H.323 and SIP VoIP basic call communication for BCM-to-BCM calls. H.323 also supports the same features that the MCDN capability supports.

BCM50 3.0 introduces new SIP features including:

- “SIP REFER” on page 21
- “SIP proxy failover” on page 21
- “RFC 2833” on page 21

BCM50 existing SIP features include:

- support for the MCDN features with SIP
- expanded SIP interoperability to the CS1K and MCS5100

The MCDN supported features include:

- Private Name/Number
- Network Call Redirection Info (NCRI)
- Trunk Anti-Tromboning (TAT)
- ISDN Call Connection Limit (ICCL)
- Message Waiting Indication (MWI)
- Trunk Route Optimization (TRO)

In enterprise network systems, the SIP feature supports private numbering plans, optimizes the use of network traffic (TAT/TRO/ICCL), and supports centralized voice mail applications (NCRI, MWI) using the SIP messaging protocol. By making these capabilities available using the SIP protocol, you can begin to transition your network to the latest standard.

Security

BCM50 3.0 security enhancements are an extension of the BCM50 platform. The new “Security enhancements” on page 26 include the new features. The following section describes the main security features with BCM50.

- “User account access management” on page 35
- “Secure interface and audit logging” on page 36

User account access management

This feature significantly improves BCM user-account access management by enhancing password, session, account authentication, and access-management. These improvements align the BCM with the security enhancements introduced with BCM50 and add incremental capabilities.

Password Management and Policy Enhancements include

- Minimize the vulnerability of passwords
  - password characteristics are now more stringent (length, criteria)
  - password aging, history and change notification added

— forced password change on initial login

— password storage hashing with Secure Hashing Algorithm 1 (SHA1)

Session Management Enhancements minimizes the vulnerability of logged-on sessions for idle session time outs.

Account Management includes

- Minimize the vulnerability of User IDs
  — Automatic disabling of unused accounts
  — Set-based administration requires user ID and password

Account User ID Access Privilege Management includes the logged-on user ID session and access display.

These enhancements to user-account access management provide a secure BCM access environment, which makes it difficult for a malicious user to gain access to a BCM. BCM owners can enforce secure account-access controls to the BCM to ensure secure BCM management and to increase protection against potential vulnerabilities.

Secure interface and audit logging

This feature enhances interface security by adding secure access controls, security audit logs (configchange.systemlog), and system activity by User ID, date, and time. Secure Interface Access and Communications Controls provide

- support for Secure Copy (SFTP) SSH encrypted file transfers
- support for Simple Network Management Protocol (SNMP) v2 and v3, including encryption provided with v3
- BCM owner control of Nortel technical support access
- use of digital signatures and enhanced tamper detection to ensure trusted sources for software upgrades (patches and software release upgrades)
- ability to test the system ability to generate alarms and logs, including system security alarms and logs

Audit log tracks critical changes to the system and the logon attempts, including

- last successful login identification and interface
- last failed login attempt and total failed logons since last successful logon
- configuration change log to track configuration changes to system by User ID
- RADIUS Support (Centralized Authentication and Radius Client to authenticate and authorize using a centralized RADIUS server)

In addition to supporting IPsec tunnels for management, the ability to encrypt SNMP and file transfers provides BCM users an expanded capability set for secure interface communications.

With audit logging of long attempts, the BCM user can track security violation attempts and determine further action. If you suspect a user ID security breach as a result of system configuration changes, the audit logging of configuration changes provides traceability to user IDs and interfaces.

An overall increase in security you have with effective logging capabilities for Audit Trail logs, Alarm logs and Configuration Change logs.

If you require improved interface access and communications security for alarm, log, and file transfers, you can use these security enhancements. As well, you can audit and identify the critical system changes that specific users initiate.

Terminal and mobility support

The BCM50 Terminal and mobility support is equivalent to that of BCM 4.0. BCM50 supports the following phones:

- IP Phone 1110
- IP Phone 1120e
- IP Phone 1140e
- IP Phone 1210/1220/1230
- T7406E Cordless Handset
- IP Audio Conference Phone 2033
- IP Key Expansion Module I24
- IP 11xx Key Expansion Module
- IP 12xx Key Expansion Module
- IP 12xx Key Expansion Module with Display

The IP phones incorporate network management and security enhancements. You can upgrade the firmware with a patch or call sever release that provides the following:

- enhanced VLAN (configured manually or with DHCP) and PC VLAN (configured manually) tagging
- enhanced display for local Network Diagnostic Utilities

For additional terminal and mobility supported devices, see the "BCM compatibility matrix" on page 53.

Global markets

BCM50 voice prompts, which were introduced in BCM 4.0, include Polish, Finnish, Korean, Turkish, and Czech.

The following additional capabilities are available:

- addition of second dial tone for PRI/BRI
  - — In some markets, a PBX must provide a local tone to the originating party (as opposed to the central office).
  - — This feature adds the ability to provide the local tone.
- increased public received digit length from 7 to 12 digits
  - — Some markets require more than public received digits to support dial plans.

BCM50 regional bundles for APAC and EMEA are updated to include the GATI or BRI keycodes to replace expansion chassis and BRI MBM where applicable.

SRG50 Global Bundles are maintained and updated. SRG50 users geographic localization enhancements of BCM50.

Localization is a key goal for BCM50. Onboard Analog and BRI trunk profiles are localized to new markets to offer an integrated solution without dependency on external MBMs for small sites. This solution offers easy installation, improved margins, and a competitive offer in global regions.

The following country matrix table reflects new analog, BRI, and country support in BCM50.

Table 1 Country matrix

	Trunks			MBM	
Region	**GATM**	**GATI**	**BRI**	**R2MFC**	**DID**
N. America					Yes
EMEA					
UK		Yes	Yes		
Poland		Yes	Yes		
Bahrain	DS	Yes	Yes		
Saudi			Yes		
UAE			Yes		
Qatar			Yes		
Ireland	DS/CLI	Yes	Yes		
South Africa			Yes		
Spain			Yes		
France			Yes		
Russian Federation			Yes		
Turkey			Yes		
Greece			Yes		
Egypt			Yes		
Kuwait			Yes		
Switzerland			Yes		
Sweden			Yes		
Norway			Yes		
Netherlands			Yes		
Italy			Yes		
Germany			Yes		
Denmark			Yes		
Belgium			Yes		
Austria			Yes		

	Trunks			MBM	
Region	**GATM**	**GATI**	**BRI**	**R2MFC**	**DID**
CALA					
Caribbean					Yes
Mexico		DS		Yes	
Brazil		Yes		Yes	
Chile				Yes	
Argentina				Yes	
Colombia				Yes	
Venezuela				Yes	
GC					
Hong Kong	DS/CLI	DS/CLI			
PRC	DS/CLI	DS/CLI			
Taiwan		DS/CLI			Yes
APAC					
Australia		Yes	Yes		
New Zealand			Yes		
Korea		same as BCM50 1.0	Yes		
India		same as BCM50 1.0	Yes		

Support, security and servicing

BCM50 provides solutions for client support, replacement parts, upgrades, and enhanced servicing.

Client operating system support

BCM50 supports Microsoft Windows 2000 Professional, Microsoft Windows XP Professional, Windows Vista, Citrix Metaframe XP for Element Manager, and Citrix client support equivalent to BCM 4.0. BCM applications for BCM50 support the following Vista versions: Microsoft Vista Business, Microsoft Vista Ultimate and Microsoft Vista Enterprise. For more information about BCM50 Microsoft Vista support, see “Microsoft Vista operating system” on page 27.

Field replaceable units

Field replaceable units (FRU) strategy is consistent with previous BCM50 systems, including a replacement router and a BRI CDC card. CDCs are not hot-pluggable.

Field upgrades

The BCM50 upgrade kit is available. Element Manager and NCM support remote and scheduled upgrades from BCM50 1.0 and 2.0, not including router upgrade support.

Servicing

Serviceability enhancements in BCM50 include the following:

- BRI CDC offered as a FRU
- reduced dependency on DIP switches for Media Bay Modules as global profiles are downloadable

BCM50 management

You can quickly and easily install, configure, and administer BCM50. These topics summarize the BCM50 management areas:

- "Ease of installation"
- “Remote management accessibility” on page 41
- “On-box and device manageability features” on page 41
- “Set-based administration” on page 42, for no-PC programming of most of the system
- “Business Element Manager” on page 43, interface that supports all aspects of BCM50 element management
- “Network Configuration Manager” on page 45, for multi element support

Ease of installation

BCM50 installation easy with innovative hardware and management tools.

The simple rack-and-stack nature of BCM50 physical installation, with the multipurpose RJ-45-based connector strategy, provides easy installation. The dedicated RJ-45 port for management access provides easy access to the unit for on-site PC-based element management tasks.

For BCM50 installations that require data networking, IP sets, or VoIP trunking, BCM50 can function as a DHCP client to a network DHCP server for automated IP address assignment. BCM50 can also function as a DHCP server to provide both IP phones and a directly connected Element Manager PC with the IP configuration.

You can perform all configuration using the “Business Element Manager” on page 43.

Startup profile

To accelerate the initial installation programming of system-level parameters, you can use the Startup Profile to quickly place the BCM50 in a basic operational state, ready to program, without having to use Element Manager or set-based administration.

The Startup Profile is an easy-to-use template you can datafill using Microsoft Excel. The Startup Profile provides a quick interface to define, for example, the following parameters:

- system profile including country, telephony template, and key voice mail attributes
- system IP parameters
- system-level telephony attributes to automatically create the system DNs
- keycode information through automated application of keycodes
- users and groups

You fill out the template, save it to a USB storage device, and insert the memory stick into the USB port of the BCM50 during the initial startup of the system. This information is read into the BCM50 and applied during a single restart sequence.

The Startup Profile is similar to the Quickstart wizard of the BCM200 and BCM400, but it can be datafilled and applied without an IP connection to the unit, a PC, or telephone. The Startup Profile executes quickly, and includes a broad scope of system-level parameters.

Remote management accessibility

BCM50 has an integrated analog modem that can accept an incoming modem call on any BCM50 system line. You can configure the BCM50 system to have the modem automatically answer a specific line with configuration options. You can manage from BRI. Remote users can also initiate a voice call to a person or an autoattendant, who transfers the call to the modem.

The analog modem also supports callback for management access to the BCM50, which can be used to support automatic dial-out on SNMP traps and automated sending of Call Detail Records (CDR) to a remote CDR collection point. The modem is also enhanced with CLID.

Although Nortel does not recommend that you use the analog modem to transfer large files, the modem provides a flexible method of remote access to remotely perform all programming tasks.

The BCM50e and BCM50a provides remote management capability with a high-speed connection. Tasks such as transferring backup files to a remote destination and transferring software update files, CDR records, and log files can occur more efficiently than over the analog modem.

On-box and device manageability features

BCM50 has an SNMPv3 interface that includes support for SNMP v1 and v2 for management by legacy SNMP managers. SNMPv3 delivers improved security features for SNMP device access.

The BCM50 main unit supports the following versions of SNMP:

- SNMP v1—the first implementation of SNMP; this version supports protocols such as IP
- SNMP v2C—provides improved efficiency and error handling
- SNMP v3—provides improvements in security and privacy

Using the BCM50 Element Manager, you can select which versions of SNMP you want the BCM50 agent to support.

Management Information Bases (MIB) provide access to the managed objects of a system and specify the format of traps. BCM50 supports these standard MIBs for remote management:

- MIBII RFC 1213—second version of the MIB for use with network management protocols in a TCP/IP-based internet. This MIB includes System Group and Interfaces Group and is a baseline RFC implemented by data-networking systems.
- Entity MIB RFC 2737—describes managed objects used to manage multiple logical and physical entities to manage by a single SNMP agent.
- System Host MIB RFC 2790 MIB for to manage host systems — defines a set of objects common across many computer system architectures that are useful to manage host computers, such as memory and CPU.
- SmallSiteEvent MIB for traps.
- RFC 2261—SNMP Framework MIB.

BCM50 adopts the Common Information Model (CIM) standard according to the industry standards organization Distributed Management Task Force (DMTF), which provides a modeled method to manage system-programming parameters. BCM50 uses the transport mechanism CIM operations over HTTP using XML, also referred to as CIM-XML. The BCM50 CIM-XML interface provides a consistent way to manage data on the device, whether by the BCM50 Element Manager, NCM, or third-party network or service-management applications.

Log management

BCM50 log management includes, in addition to the component logs that BCM200 and BCM400 systems provide, security logs, configuration change logs, alarm logs, and system logs.

Set-based administration

BCM50 gives you the ability to use a telephone interface to program much of the BCM50 system. Set-based administration benefits include:

- BCM50 installations that have no TCP/IP connectivity
- BCM50 installations where the installer has no on-site access to a computer
- installers who prefer the speed of programming using set-based administration
- installers who are familiar with the Norstar interface

With set-based administration, you can manage

- core telephony
- voice mail services
- IP network settings
- keycode entry
- admin password change
- modem on or off

Support is available for multiple languages, consistent with Norstar set-based administration.

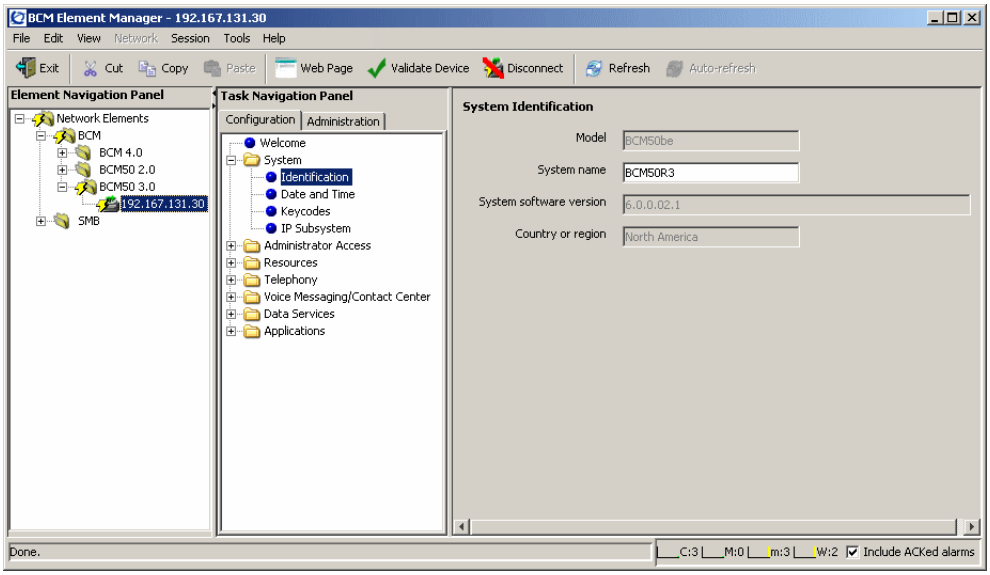
Business Element Manager

Business Element Manager provides access to BCM50 information in a new off-box management architecture. Element Manager has a task-based interface for ease of use, see Figure 9.

If you use Business Communications Manager Unified Manager, performing common BCM50 programming tasks is easy, fast, and information-rich with Element Manager, which requires minimal clicking through the interface to perform tasks. You can access any programming screen in three or fewer mouse-clicks.

Programming data is enhanced in the Element Manager to quickly show all the associations between data in the form of tables. This eliminates looking in multiple places to obtain a system view of the programming.

Figure 9 Business Element Manager interface



Element Manager runs on a PC, and the information required to draw the screens is contained locally within the client application. The only data transferred between Element Manager and the BCM50 are queries and actual data. Element Manager has familiar Microsoft Office-like capabilities, such as the ability to sort information.

Element Manager integrates all the traditional BCM administration tools, including managing backups and software updates.

Element Manager has an element navigation panel to organize a network of elements. You can simultaneously manage multiple elements. After you connect to an element, you can perform configuration and administration tasks.

Business Element Manager administration interface

The Element Manager administration management environment includes

- BCM50 diagnostic and maintenance tools, including access to BCM Monitor.
- Fault management for viewing BCM50 alarms. You can set which alarms are displayed in the Element Manager alarm browser and which alarms trigger an SNMP trap.

- Log management for off-box transfer of logs, including component logs and administrator logs such as alarm log, security log, configuration change log, and system log.
- Software management tools for software updates (for example, for corrective software) and software upgrades.
- Backup and restore. You can schedule full back ups with the option of excluding certain components which are presented in the user interface. A scheduled backup provides the ability to routinely perform a backup, which you can save on the BCM50 hard drive or transfer to an off-box destination such as network folder, FTP server, or locally attached USB storage device.

For backup and restore, software management, and log management, a flexible set of source and destinations is supported along with protocols to access them. For example, you can save backups from the BCM50 to either the USB port, the Element Manager client PC (on-demand only), a shared drive available on the network, or a remote FTP server.

Software updates

To ensure that BCM50 maintenance costs are low, even in an environment of security and corrective content updates, the BCM50 handles software updates as follows:

- You can download software updates to the BCM50, either on-demand or according to a schedule, from a USB port, a shared network drive, a remote FTP server, or a client PC.
- Update software is automatically checked against the BCM50 software history and validated before you transfer it
- You can schedule the software update separately. For example, you can schedule a download for Tuesday night, but you can schedule the application for Friday at 2:00.
- You can program multiple software-update packages to be applied at the same time.
- One software-update package can include updates for multiple software components. While many software updates do not require a system restart, some software components require a restart for the update to take effect. No more than one system restart is required if one or more of the software components being updated by the software-update package requires a reboot.
- Software upgrades are handled in the same way and use the same tool as software updates.
- You can set up the entire software-update process for hands-off operation if the software content can either be downloaded remotely or sent and installed from the USB port.

Keycodes

The BCM keycode structure now includes the following capabilities:

- One keycode validates all feature entitlements, which simplifies installation.
- You can apply keycodes in a number of ways:
  - through Element Manager
  - through set-based administration
  - through NCM

— through a USB memory stick

- Enable BRI with a keycode

Network Configuration Manager

Many Business Communications Manager customers already use the optional client/server-based management application Network Configuration Manager (NCM) to manage their multisite BCM200/400 network. Designed to provide a system-wide perspective for up to 2000 BCM devices, NCM is a centralized database that stores information about every Business Communications Manager device on your network.

NCM for BCM50 includes centralized backup and restore management, common file distribution (for example, system greeting files), parameter configuration, and automated software-update distribution. You can manage large BCM50 networks and mixed BCM50/200/400 networks using the NCM.

BCM50 applications

BCM50 has a wide range of applications. You enable these applications through keycodes, and you require no additional hardware.

BCM50 provides 10 ports to connect to CallPilot and Intelligent Contact Center. Each port supports one connection to an application. For example, four callers can leave voice messages, and two callers can be in the autoattendant, while four callers listen to voice messages. The number of ports can support a fully configured a BCM50 system with a full complement of voice mailboxes.

BCM50 is delivered with Mailbox Manager and CallPilot. Keycoded CallPilot options are also available, as are other BCM50 applications, such as Meet-Me Conferencing, LAN CTE, Personal Call Manager, and Call Detail Recording.

Meet-Me Conferencing

For information on this new feature, see “Meet-Me Conferencing” on page 22.

Mailbox Manager

Mailbox Manager directly replaces the BCM 3.x CallPilot Mailbox Manager. In particular, you can administer the following features through a browser:

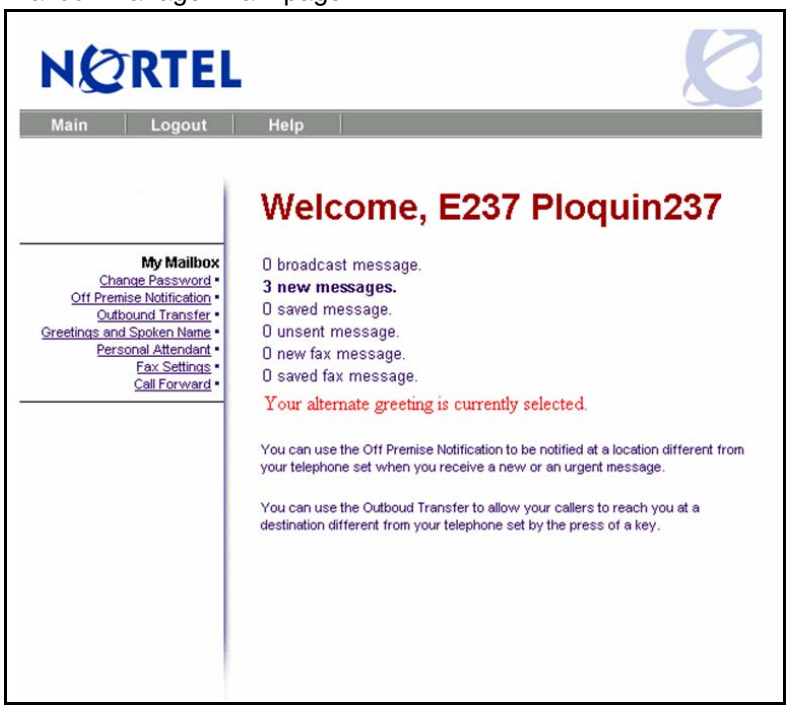
- Off Premise Notification settings
- Password
- Outbound transfer settings
- Spoken name (import, export, play and record)
- Primary, Alternate, and Personal Greetings (import, export, play, and record)
- Personal Attendant DN

- Fax settings (if fax messaging keycode is applied)
- Call forward to voice mail and display CLID

Note: You can administer same items with F981. Currently, you can administer only subscriber mailboxes, the general delivery mailbox, and the system administrator mailbox through the Mailbox Manager application.

The main page shows your mailbox status information, such as whether the telephone is forwarded, the mailbox is full, the number of broadcast messages, new messages and how many are urgent, saved messages, unsent messages (if you use the CallPilot user interface), new fax messages, and saved fax messages. A warning appears about an Off Premise Notification destination and the outbound transfer having failed. If you use the alternative greeting, an indication of its use is presented with an indication of whether messages are being accepted.

Figure 10 Mailbox Manager main page


NORTEL
Main
Logout
Help
Welcome, E237 Ploquin237
My Mailbox
Change Password
Off Premise Notification
Outbound Transfer
Greetings and Spoken Name
Personal Attendant
Fax Settings
Call Forward
0 broadcast message.
3 new messages.
0 saved message.
0 unsent message.
0 new fax message.
0 saved fax message.
Your alternate greeting is currently selected.
You can use the Off Premise Notification to be notified at a location different from your telephone set when you receive a new or an urgent message.
You can use the Outboud Transfer to allow your callers to reach you at a destination different from your telephone set by the press of a key.

Mailbox Manager features

My Mailbox

Information about the mailbox includes the number of each type of messages (if more then one message) and other information related to the state of the mailbox, including

- The number of broadcast messages.
- The number of new messages. If one or more is urgent, this information is specified.
- The number of unsent messages.

- The number of saved messages.
- The number of new fax messages (if the fax keycode is applied).
- The number of saved fax messages (if the fax keycode is applied).
- Warning messages that appear in red if
  - an extension is specified for the mailbox, but no telephone is associated with the extension
  - the telephone is currently forwarded
  - an off-premise notification is not allowed
  - the outbound transfer is not allowed
  - the alternative greeting is selected
  - messages are not accepted
  - the mailbox is full

Also, My Mailbox displays useful messages to help you familiarize yourself with lesser-known features:

- You can use the Off Premise Notification to be notified at a location different from your telephone when you receive a new or an urgent message.
- You can use the Outbound Transfer to allow your callers to reach you at a destination different from your telephone by the pressing a key.

Off Premise Notification

Use Off Premise Notification (OPN) to enter a destination that can be an extension, an external number, or a pager number. You can turn notifications on or off, apply start and end times, and select a message type.

Outbound Transfer

You can enter an extension number as your outbound transfer destination or a telephone number to for outbound calling.

Greeting and Spoken Name

You can use the greetings and spoken name page to record or re-record your spoken name, standard greetings (primary and alternative), and three personalized greetings. For each spoken name and greeting, a guide text informs you whether the spoken name and greeting are recorded.

Personal Attendant

You can select the system attendant as your personal attendant (default setting), or you can enter a specific extension.

Fax Setting

Use the Fax Setting page to enter a destination where faxes can be printed. The destination can be an extension or a telephone number, if outcalling is enabled. For users without the outcalling capability, you can enter only an extension on the Fax Setting page.

Call Forward

You can use the Call Forward page to forward your phone to voice mail. When you forwarded the telephone to voice mail, you can view the callers being forwarded to your mailbox on the telephone screen. You can select which calls you want to retrieve with F987.

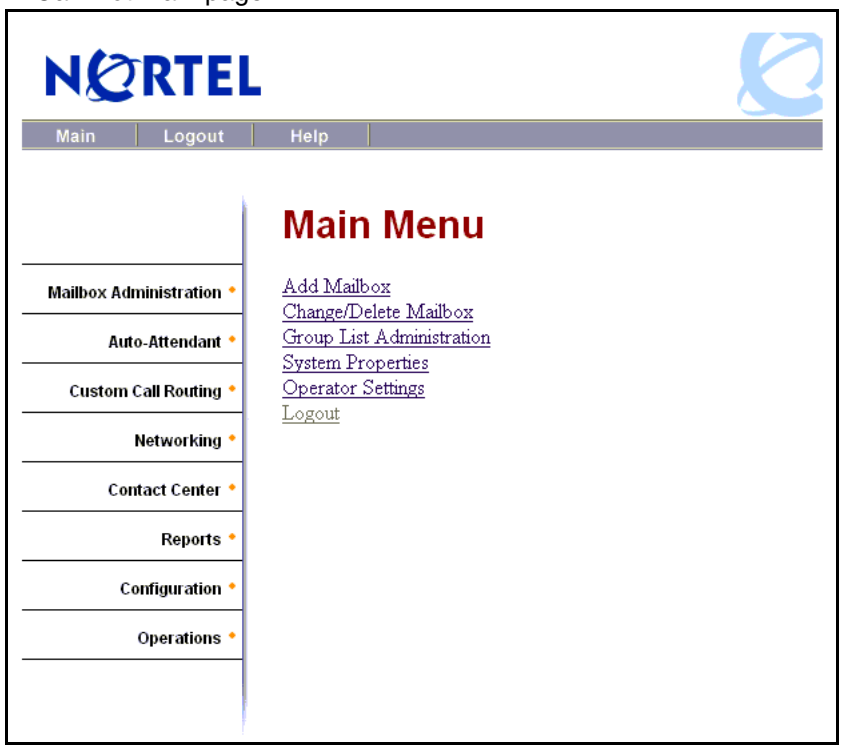
CallPilot

BCM50 is a versatile business communications tool that you can use to

- answer incoming calls
- offer callers options to route their calls or to access information
- provide advanced voice mail, Auto Attendant, and call-handling capabilities

CallPilot Manager is a Web-based application that is accessible through the BCM50 Element Manager. You use CallPilot Manager to set up and administer BCM50.

Figure 11 CallPilot main page



Features included with CallPilot

CallPilot for BCM50 includes the following features.

Voicemail

The Voicemail feature records messages and stores them in a mailbox for easy retrieval. Business telephones on your system can have their own mailbox and greeting. You can quickly distribute information to departments and work groups.

Auto Attendant

Auto Attendant is the CallPilot answering service that promptly answers your business calls 24 hours a day with a company greeting, plays a list of options to callers, and performs call-routing functions in response to caller selections.

Custom Call Routing

Custom Call Routing (CRC) enhances the Auto Attendant menu with custom menus and information messages. With CCR, you can determine the menu commands and record the voice prompts that guide callers along call paths.

Fax Answering

Outside callers use Fax Answering to send faxes to the main site telephone number. Fax Answering is available even if you do not have the Fax option installed on your system. With Fax Answering, a fax call that arrives through the Auto Attendant or CCR is transferred to a specified extension.

CallPilot options

CallPilot has options that enhance your office communications. You need a keycode to enable a CallPilot option. Contact your vendor to purchase a software authorization code.

Message networking

Message networking links your BCM50 system with other voice mail systems and allows the exchange of voice messages between users at different sites. CallPilot supports Voice Profile for Internet Mail (VPIM) and Audio Messaging Interchange Specification (AMIS) networking.

For more information, see the *CallPilot Message Networking Set Up and Operation Guide*.

Fax

Fax is a CallPilot option that enhances your office communications by providing incoming and outgoing fax capability (two ports only). With Fax, callers can send and retrieve fax messages as easily as they send and retrieve voice messages. The Fax option includes Fax Mail, Fax On Demand, and Fax Overflow. Fax Answering is available even if you do not have the Fax option installed on your system.

For more information about Fax, see the *CallPilot Fax Set Up and Operation Guide*.

Unified messaging

With Unified messaging, you can use your e-mail application to access voice, fax, and text messages from your personal computer. You can use Unified Messaging with several popular e-mail application, including

- Microsoft Outlook 2000, Outlook 2002 (XP), Outlook 2003 including Internet Mail Mode
- Lotus Notes 5.x and 6.x
- GroupWise 6.x
- Microsoft Outlook Express 5.x and 6.x
- Netscape Messenger (Netscape Communicator) 6.2x
- Netscape Mail 7.0x
- Qualcomm Eudora Pro 6.1.2

For more information, see the *Unified Messaging Configuration Guide*.

CallPilot and Voicemail enhancements

BCM50 builds upon the existing set of CallPilot and Voicemail capabilities by including a set of features on the BCM CallPilot offering.

These features include the following

- significant increases in number of greeting tables, company greetings, and Custom Call Routing (CCR) trees
  - — This increase provides the flexibility to use a different Auto Attendant/CCR for different incoming lines.
- F983 Class Of Service Administration
  - — Expands set-based administration to include programming of Class of Service
- prevention of trivial mailbox passwords
  - — This prevents trivial passwords (for example, 1111 or 1234) when enabled.
- up to five alternative DNs for each mailbox with Message Waiting Indicator on six telephones
  - — Previously, up to two alternative DNs for each mailbox or MWI on three telephones was supported
- Mailbox assignable feature restrictions
  - — The administrator can limit features for selected mailboxes in the system. This feature is especially applicable to retail and hospitality industries.
- Unified Messaging R2.5 support of Citrix
  - — Unified messaging 2.5 is now supported in a Citrix environment.
- ability to receive VPIM broadcast messages from M1 CallPilot
  - — The system can rebroadcast a network message from M1 without additional programming.
- additional voice mail prompt languages including Polish, Irish English, Finnish, Korean and Turkish

Intelligent Contact Center

Intelligent Contact Center (ICC) is an evolution of the existing Call Center capability on BCM. ICC has the same functionality as the current Professional Call Center with the ability to choose exactly the number of agents and skillsets that a customer or customer site requires. BCM50 3.0 introduces two new features, "Intelligent Contact Center API's" on page 24 and "Silent Record-a-call" on page 23.

The existing Intelligent Contact Center provides the following features:

- Provides maximum flexibility in granularity.
- Any combination of Agents and Skillsets within the boundaries of a platform. This combination confusing of features between Basic and Professional. Channel partners and customers need not to worry about which functionality belongs to which product.
  - — Contact Center with Professional Contact Center level of functionality.
- Simplifies product offering
  - — Contact Center, x skillsets, x agents, RCC
  - — Eliminates Basic, Pro, and upgrade between the two
- Increases market potential
  - — Customers that require more skillsets than agents

  Example: Real Estate — 3 receptionists (3 agents) answering telephones for 20 real estate agents (20 skillsets)
  - — Big-box retail — 3 receptionists (3 agents) answering telephones for 12 departments (12 skillsets).

Optional components include

- x agents (keycodes offer granular selection of the number of desired agents)
- x skillsets (keycodes offer granular selection of the number of desired skillsets)
- Reporting for CC
- Multimedia CC

For more information, see the *Intelligent Contact Center Set Up and Operation Guide*.

Multimedia Contact Center

Agents and callers can use the Multimedia Contact Center to participate in multimedia calls that include

- speaking over a Public Switched Telephone Network (PSTN) voice connection
- text chatting
- exchanging and viewing Web pages
- viewing screen captures (sent by an agent to the caller)

Multimedia Contact Center supports two call types:

- Phone-and-browser calls (using PSTN), which integrate a standard voice call with a Contact Center agent and a Multimedia Contact Center browser call session with follow-me browsing, text chat, and screen-capture push.
- Browser-only calls, which have the same browser features of phone-and-browser calls but no voice call component.

Local Area Network Computer Telephony Engine

BCM Computer Telephony Integration (CTI) products provide an interface between your personal computer and your BCM50 system. With these products, you can use telephony applications through the Windows operating system to control your telephone.

One BCM CIT software component is Local Area Network Computer Telephony Engine (LAN CTE). LAN CTE provides an interface between your personal computer, your telephone, and the BCM50 system. With LAN CTE installed on your computer, you can run LAN CTE or TAPI applications to communicate with and control your telephone.

For more information, see the *LAN CTE Configuration Guide*.

Call Detail Recording

Call Detail Recording (CDR) is an application that collects call activity. Each time a telephone call is made to or from your company, CDR can record information about the call. You can use the information CDR collects to create reports about call activity. CDR also provides an interface to third-party applications for call accounting and billing.

For more information, see the *Call Detail Recording System Administration Guide*.

Personal call manager

Personal Call Manager is a TAPI-based application that provides an easy-to-use interface between your computer and your telephone. You use the telephone to speak with a caller. You can customize your Address Book and your calls. Basic functions that Personal Call Manager performs include making and answering calls, placing calls on hold, transferring calls, and making conference calls.

For more information, see the *Personal Call Manager User Guide*.

BCM compatibility matrix

The following table indicates the compatibility of components and features through the BCM product line. For a BCM50 system deployed in a hybrid configuration, see recommendations for "BCM50 hybrid configuration" on page 57.

Component or feature	BCM 3.6	BCM 3.7	BCM50 1.0	BCM50e 1.0	BCM50a 1.0	BCM 4.0	BCM50b 2.0 and 3.0	BCM50a/ba 2.0 and 3.0	BCM50e/ be 2.0 and 3.0
Operating system									
Windows NT 4 Embedded	Yes	Yes	No	No	No	No	No	No	No
Nortel Carrier Grade Linux	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hardware									
Digital Terminals	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
T7000	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
T7100 and M7100	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
T7208 and M7208	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
T7316 and M7324	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
T7316e	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
T7406	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
T7406e	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
T24 KIM and CAP	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Norstar Audio Conference Unit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Doorphone	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes
IP Terminals									
IP Phone 2001	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IP Phone 2002	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IP Phone 2004	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Component or feature	BCM 3.6	BCM 3.7	BCM50 1.0	BCM50e 1.0	BCM50a 1.0	BCM 4.0	BCM50b 2.0 and 3.0	BCM50a/ba 2.0 and 3.0	BCM50e/ be 2.0 and 3.0
IP Phone 2007	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IP Key Expansion Module 24	No	No	No	No	No	Yes	Yes	Yes	Yes
IP 11xx Key Expansion Module	No	No	No	No	No	No	2.0 No 3.0 Yes	2.0 No 3.0 Yes	2.0 No 3.0 Yes
IP 12xx Key Expansion Module	No	No	No	No	No	No	2.0 No 3.0 Yes	2.0 No 3.0 Yes	2.0 No 3.0 Yes
IP 12xx Key Expansion Module with Display	No	No	No	No	No	No	2.0 No 3.0 Yes	2.0 No 3.0 Yes	2.0 No 3.0 Yes
i2050 Softphone	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IP Softphone 2050	No	No	No	No	No	No	Yes	Yes	Yes
IP Phone 2007	No	Yes	No	No	No	Yes	Yes	Yes	Yes
IP Phone 1110	No	No	No	No	No	No	2.0 No 3.0 Yes	2.0 No 3.0 Yes	2.0 No 3.0 Yes
IP Phone 1120e	No	No	No	No	No	Yes	Yes	Yes	Yes
IP Phone 1140e	No	No	No	No	No	Yes	Yes	Yes	Yes
IP Phone 1210/1220/ 1230						No	2.0 No 3.0 Yes	2.0 No 3.0 Yes	2.0 No 3.0 Yes
IP Audio Conference Phone 2033	No	No	No	No	No	Yes	Yes	Yes	Yes
WLAN IP 2210	Yes - with patch	Yes	No	No	No	Yes	Yes	Yes	Yes
WLAN IP 2211	Yes - with patch	Yes	No	No	No	Yes	Yes	Yes	Yes

Component or feature	**BCM 3.6**	**BCM 3.7**	**BCM50 1.0**	**BCM50e 1.0**	**BCM50a 1.0**	**BCM 4.0**	**BCM50b 2.0 and 3.0**	**BCM50a/ba 2.0 and 3.0**	**BCM50e/ be 2.0 and 3.0**
WLAN IP 2212	No	No	No	No	No	Yes	Yes	Yes	Yes
MCS Card	MSC1A/ MSC1B		Integrated CSC			Yes	Integrated CSC		
Expansion unit	1 Exp with 6 MBMs		2 Exp with 1 MBM			1 Exp with 6 MBMs	2 Exp with 1 MBM		
Applications									
Integrated IVR	Yes	Yes	No	No	No	Yes	No	No	No
IP Sets	89	89	32	32	32	64	32	32	32
IP Trunks	60	60	10	10	10	60	12	12	12
H.323 with MCDN	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SIP	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes
SIP with MCDN	No	No	No	No	No	Yes	Yes	Yes	Yes
SRG	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Voice Mail ports	32	32	10	10	10	32	10	10	10
IP Music	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes
Fax ports	2	2	2	2	2	2	2	2	2
IP Trunks Codecs	711-729-723		711-729						
Management									
NCM	NCM 4.0	NCM 4.0	NCM 4.0	NCM 4.0	NCM 4.0	NCM 4.0	NCM 4.0	NCM 4.0	NCM 4.0
NetIQ support	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Unified Manager	Yes	Yes	No	No	No	No	No	No	No
System Set-Based Admin (F9*8)	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Element Manager	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Set-Based Admin									
Telephony	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CallPilot	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
PVQM	No	No	No	No	No	Yes	Yes	Yes	Yes

Component or feature	BCM 3.6	BCM 3.7	BCM50 1.0	BCM50e 1.0	BCM50a 1.0	BCM 4.0	BCM50b 2.0 and 3.0	BCM50a/ba 2.0 and 3.0	BCM50e/ be 2.0 and 3.0
Applications									
LAN CTE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CDR	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Meet-Me Conferencing	No	No	No	No	No	No	2.0 No 3.0 Yes	2.0 No 3.0 Yes	2.0 No 3.0 Yes
Activity Reporter	No	No	No	No	No	No	2.0 No 3.0 Yes	2.0 No 3.0 Yes	2.0 No 3.0 Yes
Mailbox Manager	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes
Operator MB Manager	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes
Intelligent Contact Center									
Basic Contact Center	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Professional Contact Center	Yes	Yes	No	No	No	No	No	No	No
Reporting for Contact Center	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes
Multimedia Contact Center	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes
Silent Record-a-Call	No	No	No	No	No	No	2.0 No 3.0 Yes	2.0 No 3.0 Yes	2.0 No 3.0 Yes
UPS support	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Backup and Restore	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Upgrade from previous version	From 3.0, 3.01 and 3.5	From 3.5 and 3.6	Not available			Yes	Yes	Yes	Yes
BCM Imaging Tool	Yes	Yes	No	No	No	Yes	No	No	No
Level 1 and 2 Reset	No	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Wireless									

Component or feature	BCM 3.6	BCM 3.7	BCM50 1.0	BCM50e 1.0	BCM50a 1.0	BCM 4.0	BCM50b 2.0 and 3.0	BCM50a/ba 2.0 and 3.0	BCM50e/ be 2.0 and 3.0
T7406 and T7406e	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
802.11b WVoIP i22xx	Yes - with patch	Yes	No	No	No	Yes	Yes	Yes	Yes
Digital Mobility	No	Yes	No	No	No	Yes	Yes	Yes	Yes
Data services									
Firewall	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
ISDN Dial-up	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes
ADSL									
Client	PPPoE		No	Yes	Yes	Yes	Yes	Yes	Yes
Integrated ADSL Modem	No	No	No	Yes	No	No	No	Yes	No
VPN									
IPsec Client	Terminating		No	Terminating out		Yes	Yes	Yes	Yes
IPsec Branch	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
PPTP	Yes	Yes	No	No	No	No	No	No	Yes
DHCP Client	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DHCP Server	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
DHCP Relay	No	No	No	No	No	Yes	Yes	Yes	Yes
NAT	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Routing Protocols	RIP, OSPF and Static		No	RIP and Static		Yes	Yes	Yes	Yes
QoS	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes
Dial Back-up	Yes	Yes	No	No	No	Yes	No	Yes	Yes
SNMP	V1	V1	ver.1, 2, and 3				ver.1, 2, and 3		

BCM50 hybrid configuration

A BCM50 system is defined as a hybrid configuration if it is configured with a mix of IP phones, IP clients, or IP trunks and with non-IP phones, terminals, or trunks (digital phones, analog phones, FAX machines, digital T1/E1/PRI trunks, BRI interfaces, and analog trunks).

For a BCM50 system deployed in a hybrid configuration, it is recommended that the total number of stations (digital phones, IP phones, analog terminals, BRI B channels for station side) not exceed 50. Additional stations can reduce the performance effectiveness of the BCM50.

If you use Meet Me Conferencing, Nortel recommends you increase the number of voice mail plus Call Centre (Voice Mail + CC) resources from 10 to 15.

When the number of voice mail plus Call Centre resources exceeds 10, the following engineering rule applies:

- For a BCM50 system deployed in a hybrid configuration, if the number of voice mail plus Call Centre resources required exceeds 10 (maximum 15) and the trunks use the G.729 codec, the number of IP trunks must not exceed 10.
- The number of IP trunks may number 12 if the trunks are configured with the G.711 codec.

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